2008

Test 1930: Challenger MT965B Diesel

Nebraska Tractor Test Laboratory
University of Nebraska-Lincoln, tractortestlab@unl.edu

NEBRASKA OECD TRACTOR TEST 1930 – SUMMARY 602
CHALLENGER MT965B DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1050 rpm)					
440.32 *(328.35)*	2100	27.88 *(105.54)*	0.444 *(0.270)*	15.79 *(3.11)*	
Standard Power Take-off Speed - (PTO speed - 1000 rpm)					
478.49 *(356.81)*	2001	29.13 *(110.26)*	0.427 *(0.259)*	16.43 *(3.24)*	
Maximum Power (1 hour)					
501.68 *(374.10)*	1750	28.40 *(107.52)*	0.397 *(0.241)*	17.66 *(3.48)*	
VARYING POWER AND FUEL CONSUMPTION					
440.32 *(328.35)*	2100	27.89 *(105.54)*	0.444 *(0.270)*	15.79 *(3.11)*	Air temperature
391.41 *(291.87)*	2196	26.72 *(101.13)*	0.478 *(0.291)*	14.65 *(2.89)*	83°F *(29°C)*
293.73 *(219.04)*	2200	22.09 *(83.63)*	0.527 *(0.321)*	13.30 *(2.62)*	Relative humidity
195.65 *(145.89)*	2200	16.73 *(63.32)*	0.599 *(0.364)*	11.70 *(2.30)*	69%
96.15 *(71.70)*	2200	11.27 *(42.68)*	0.822 *(0.500)*	8.53 *(1.68)*	Barometer
2.51 *(1.87)*	2200	6.59 *(20.97)*	18.399 *(11.192)*	0.38 *(0.08)*	28.45" Hg *(96.34 kPa)*

Maximum Torque - 1728 lb.-ft. *(2343 Nm)* at 1303 rpm
Maximum Torque Rise - 56.9%
Torque rise at 1700 engine rpm - 40.8%
Power increase at 1750 engine rpm - 13.9%

DRAWBAR PERFORMANCE (Unballasted)
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—6th Gear									
396.28 *(295.51)*	34846 *(155.00)*	4.26 *(6.86)*	2099	3.67	0.497 *(0.303)*	14.09 *(2.77)*	190 *(88)*	71 *(22)*	28.58 *(96.78)*
75% of Pull at Maximum Power—6th Gear									
315.06 *(234.94)*	26112 *(116.15)*	4.52 *(7.28)*	2200	2.40	0.550 *(0.335)*	12.74 *(2.51)*	189 *(87)*	79 *(26)*	28.71 *(97.22)*
50% of Pull at Maximum Power—6th Gear									
211.94 *(158.05)*	17401 *(77.40)*	4.57 *(7.35)*	2198	1.36	0.644 *(0.392)*	10.87 *(2.14)*	188 *(87)*	81 *(27)*	28.71 *(97.22)*
75% of Pull at Reduced Engine Speed—9th Gear									
314.61 *(234.60)*	26116 *(116.17)*	4.52 *(7.27)*	1539	2.42	0.478 *(0.291)*	14.66 *(2.89)*	190 *(88)*	80 *(27)*	28.71 *(97.22)*
50% of Pull at Reduced Engine Speed—9th Gear									
211.40 *(157.64)*	17396 *(77.38)*	4.56 *(7.33)*	1537	1.48	0.502 *(0.305)*	13.96 *(2.75)*	189 *(87)*	82 *(28)*	28.71 *(97.22)*

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: June 2 - 19, 2008

Manufacturer: AGCO Corporation, 4205 River Green Parkway, Duluth Ga 30096

FUEL, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8416 **Fuel weight** 7.007 lbs/gal *(0.840 kg/l)* **Oil SAE** 10W-30 **API service classification** CI-4 **Transmission and hydraulic lubricant** AGCO Trandraulic 821 XL fluid **Total time engine was operated:** 35.0 hours

ENGINE: Make Caterpillar Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.***EJG01193* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.709" x 7.205" *(145.0 mm x 183.0 mm)* **Compression ratio** 16.3 to 1 **Displacement** 1105 cu in *(18130 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic oil, radiator for transmission and front and rear axle oil **Fuel filter** two paper elements and water separator **Muffler** vertical **Cooling medium temperature control** 2 thermostats

ENGINE OPERATING PARAMETERS: Fuel rate: 188.3 - 199.7 lb/h *(85.4 - 90.6 kg/h)* **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 18.9 - 21.8 psi *(130 - 150 kPa)* as measured 20.8 psi *(143 kPa)*

CHASSIS: Type four wheel drive with triples **Serial No.***AGCCO965JNTTG1040* **Tread width** rear 77.0" *(1955 mm)* to 183.0" *(4650 mm)* front 77.0" *(1955 mm)* to 183.0" *(4650 mm)* **Wheelbase** 155.5" *(3950 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph *(km/h)*** first 1.65 *(2.65)* second 2.09 *(3.36)* third 2.65 *(4.26)* fourth 3.36 *(5.41)* fifth 4.00 *(6.44)* sixth 4.50 (*7.25)* seventh 5.08 *(8.17)* eighth 5.72 *(9.20)* ninth 6.43 *(10.34)* tenth 7.24 *(11.65)* eleventh 8.16 *(13.14)* twelfth 9.19 *(14.79)* thirteenth 10.94 *(17.61)* fourteenth 13.89 *(22.36)* fifteenth 17.59 *(28.30)* sixteenth 24.46 *(39.36)* at 2300 rpm, reverse 1.32 *(2.12)*, 3.20 *(5.15)*, 3.60 *(5.80)*, 8.76 *(14.09)* **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated foot pedal **Steering** hydrostatic **Power take-off** 1000 rpm at 2000 engine rpm **Unladen tractor mass** 50715 lb *(23004 kg)*

DRAWBAR PERFORMANCE
Unballasted at 2100 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
					3rd Gear				
320.64 *(239.10)*	51763 *(230.25)*	2.32 *(3.74)*	2173	13.68	0.596 *(0.363)*	11.75 *(2.31)*	190 *(88)*	72 *(22)*	28.75 *(97.36)*
					4th Gear				
367.21 *(273.83)*	45743 *(203.47)*	3.01 *(4.84)*	2099	8.78	0.535 *(0.325)*	13.10 *(2.58)*	190 *(88)*	76 *(24)*	28.71 *(97.22)*
					5th Gear				
389.22 *(290.24)*	38970 *(173.35)*	3.75 *(6.03)*	2102	4.87	0.503 *(0.306)*	13.93 *(2.74)*	190 *(88)*	77 *(25)*	28.71 *(97.22)*
					6th Gear				
396.28 *(295.51)*	34846 *(155.00)*	4.26 *(6.86)*	2099	3.67	0.497 *(0.303)*	14.09 *(2.77)*	190 *(88)*	71 *(22)*	28.58 *(96.78)*
					7th Gear				
388.07 *(289.38)*	29995 *(133.42)*	4.85 *(7.81)*	2101	2.85	0.502 *(0.306)*	13.95 *(2.75)*	190 *(88)*	70 *(21)*	28.58 *(96.78)*
					8th Gear				
391.66 *(292.06)*	26815 *(119.28)*	5.48 *(8.81)*	2097	2.42	0.502 *(0.305)*	13.97 *(2.75)*	190 *(88)*	68 *(20)*	28.58 *(96.78)*
					9th Gear				
387.05 *(288.63)*	23492 *(104.50)*	6.18 *(9.94)*	2097	2.21	0.506 *(0.308)*	13.85 *(2.73)*	190 *(88)*	72 *(22)*	28.58 *(96.78)*
					10th Gear				
386.16 *(287.96)*	20706 *(92.10)*	6.99 *(11.26)*	2102	1.85	0.512 *(0.311)*	13.68 *(2.70)*	190 *(88)*	73 *(23)*	28.58 *(96.78)*
					11th Gear				
376.39 *(280.67)*	17853 *(79.42)*	7.91 *(12.72)*	2100	1.49	0.521 *(0.317)*	13.44 *(2.65)*	190 *(88)*	75 *(24)*	28.58 *(96.78)*
					12th Gear				
374.45 *(279.23)*	15733 *(69.98)*	8.93 *(14.36)*	2101	1.30	0.524 *(0.319)*	13.37 *(2.63)*	190 *(88)*	77 *(25)*	28.59 *(96.82)*

REPAIRS AND ADJUSTMENTS: An oil leak developed in the PTO gearbox during the PTO testing. An O ring was replaced and the testing continued.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the primary fuel filter was maintained at 112°F*(44°C)*. The performance figures on this summary were taken from a test conducted under the OECD Code II test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1930**, Nebraska Summary 602, December 15, 2008.

Roger M. Hoy
Director

M.F. Kocher
V.I. Adamchuk
J.A. Smith
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	dB(A)
At no load in 6th gear	77.3
Bystander	--

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi*(kPa)*	Six 520/85R46;***;6*(40)*	Six 520/85R46;***;8*(55)*
Ballast - Liquid (total)	None	None
- Cast iron (total)	None	None
Front Tires - No., size, ply & psi*(kPa)*	Six 520/85R46;***;20*(140)*	Six 520/85R46;***;12*(85)*
Ballast - Cast iron-front wheels (total)	4810 lb *(2182 kg)*	None
- Cast iron-front end (total)	4300 lb *(1950 kg)*	None
Height of Drawbar	21.5 in (*545 mm*)	22.0 in (*560 mm*)
Static Weight with operator - Rear	19385 lb *(8793 kg)*	22150 lb*(10047 kg)*
- Front	40615 lb*(18422 kg)*	28740 lb*(13036 kg)*
- Total	60000 lb*(27215 kg)*	50890 lb*(23083 kg)*

DRAWBAR PERFORMANCE
(Unballasted at 1750 RPM)
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F*(°C)* cool-ing med	Temp.°F*(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
				3rd Gear					
321.93 *(240.07)*	52317 *(232.72)*	2.31 *(3.71)*	2165	13.93	0.596 *(0.362)*	11.76 *(2.32)*	190 *(88)*	72 *(22)*	28.75 *(97.36)*
				4th Gear					
368.81 *(275.02)*	45768 *(203.59)*	3.02 *(4.86)*	2100	8.46	0.535 *(0.325)*	13.11 *(2.58)*	190 *(88)*	76 *(24)*	28.72 *(97.26)*
				5th Gear					
412.85 *(307.86)*	44913 *(199.78)*	3.45 *(5.55)*	1997	7.83	0.498 *(0.303)*	14.06 *(2.77)*	190 *(88)*	78 *(26)*	28.71 *(97.22)*
				6th Gear					
432.91 *(322.82)*	43879 *(195.18)*	3.70 *(5.95)*	1878	6.54	0.472 *(0.287)*	14.84 *(2.92)*	191 *(88)*	72 *(22)*	28.58 *(96.78)*
				7th Gear					
436.34 *(325.38)*	41473 *(184.48)*	3.95 *(6.35)*	1750	5.16	0.457 *(0.278)*	15.34 *(3.02)*	191 *(88)*	71 *(22)*	28.58 *(96.78)*
				8th Gear					
443.44 *(330.68)*	36706 *(163.28)*	4.53 *(7.29)*	1761	3.92	0.452 *(0.275)*	15.51 *(3.06)*	191 *(88)*	69 *(21)*	28.58 *(96.78)*
				9th Gear					
442.45 *(329.94)*	32592 *(144.98)*	5.09 *(8.19)*	1750	3.32	0.450 *(0.274)*	15.56 *(3.07)*	191 *(88)*	73 *(23)*	28.58 *(96.78)*
				10th Gear					
444.88 *(331.75)*	29014 *(129.06)*	5.75 *(9.25)*	1746	3.04	0.452 *(0.275)*	15.50 *(3.05)*	191 *(88)*	74 *(23)*	28.58 *(96.78)*
				11th Gear					
440.44 *(328.44)*	25393 *(112.95)*	6.50 *(10.47)*	1743	2.50	0.455 *(0.277)*	15.38 *(3.03)*	191 *(88)*	76 *(24)*	28.58 *(96.78)*
				12th Gear					
441.08 *(328.91)*	22533 *(100.23)*	7.34 *(11.81)*	1743	2.12	0.454 *(0.276)*	15.44 *(3.04)*	191 *(89)*	78 *(26)*	28.59 *(96.82)*
				13th Gear					
438.84 *(327.24)*	18610 *(82.78)*	8.84 *(14.23)*	1752	1.51	0.456 *(0.277)*	15.37 *(3.03)*	191 *(89)*	79 *(26)*	28.59 *(96.82)*

DRAWBAR PERFORMANCE
(Ballasted at 1750 RPM)
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F(°C) cool-ing med	Temp.°F(°C) Air dry bulb	Barom. inch Hg *(kPa)*
				2nd Gear					
291.81 *(217.61)*	59048 *(262.66)*	1.85 *(2.98)*	2200	14.04	0.611 *(0.372)*	11.47 *(2.26)*	189 *(87)*	65 *(18)*	28.83 *(97.63)*
				3rd Gear					
351.18 *(261.88)*	54572 *(242.75)*	2.41 *(3.88)*	2140	9.10	0.554 *(0.337)*	12.65 *(2.49)*	189 *(87)*	67 *(19)*	28.84 *(97.66)*
				4th Gear					
398.94 *(297.49)*	51868 *(230.72)*	2.88 *(4.64)*	2007	8.74	0.517 *(0.315)*	13.55 *(2.67)*	190 *(88)*	77 *(25)*	28.71 *(97.22)*
				5th Gear					
428.53 *(319.55)*	50104 *(222.87)*	3.21 *(5.16)*	1859	7.98	0.481 *(0.293)*	14.56 *(2.87)*	191 *(88)*	78 *(26)*	28.71 *(97.22)*
				6th Gear					
444.37 *(331.36)*	48150 *(214.18)*	3.46 *(5.57)*	1748	6.25	0.452 *(0.275)*	15.51 *(3.06)*	191 *(88)*	69 *(21)*	28.85 *(97.70)*
				7th Gear					
448.41 *(334.38)*	42370 *(188.47)*	3.97 *(6.39)*	1749	4.75	0.447 *(0.272)*	15.69 *(3.09)*	191 *(88)*	72 *(22)*	28.86 *(97.73)*
				8th Gear					
452.90 *(337.73)*	37613 *(167.31)*	4.52 *(7.27)*	1751	3.88	0.442 *(0.269)*	15.85 *(3.12)*	191 *(88)*	75 *(24)*	28.87 *(97.77)*
				9th Gear					
446.38 *(332.86)*	32736 *(145.62)*	5.11 *(8.23)*	1754	3.28	0.451 *(0.275)*	15.52 *(3.06)*	191 *(88)*	80 *(27)*	28.71 *(97.22)*
				10th Gear					
448.48 *(334.43)*	29081 *(129.36)*	5.78 *(9.31)*	1753	3.13	0.450 *(0.274)*	15.56 *(3.06)*	191 *(88)*	81 *(27)*	28.70 *(97.19)*
				11th Gear					
441.14 *(329.86)*	25287 *(112.48)*	6.54 *(10.53)*	1750	2.39	0.457 *(0.278)*	15.33 *(3.02)*	191 *(88)*	81 *(27)*	28.69 *(97.16)*
				12th Gear					
439.45 *(327.70)*	22258 *(99.01)*	7.40 *(11.92)*	1753	2.09	0.460 *(0.280)*	15.22 *(3.00)*	191 *(88)*	81 *(27)*	28.69 *(97.16)*
				13th Gear					
437.57 *(326.29)*	18606 *(82.76)*	8.82 *(14.19)*	1746	1.62	0.460 *(0.280)*	15.24 *(3.00)*	191 *(88)*	82 *(28)*	28.68 *(97.12)*

HYDRAULIC PERFORMANCE

CATEGORY: NA		
Quick Attach: NA		
Maximum force exerted through whole range:	NA	
i) Sustained pressure at compensator cutoff:	3067 psi *(211 bar)*	2921 psi *(201 bar)*
	Standard pump	**High flow pump**
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.7 GPM *(165.4 l/min)*	59.4 GPM *(224.7 l/min)*
iii)Pump delivery rate at maximum hydraulic power:	41.2 GPM *(156.0 l/min)*	56.5 GPM *(213.7 l/min)*
Delivery pressure:	2761 psi *(190 bar)*	2657 psi *(183 bar)*
Power:	66.4 HP *(49.5 kW)*	87.5 HP *(65.3 kW)*

CHALLENGER MT965B DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln